U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Digitaria pauciflora* Hitchcock

COMMON NAME: Florida pineland crabgrass (= twospike fingergrass, twospike crabgrass, fewflowered fingergrass)

LEAD REGION: 4

INFORMATION CURRENT AS OF: October 2005

STATUS/ACTION:

___ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status

___ New candidate

_X_ Continuing candidate

__ Non-petitioned

_X__ Petitioned - Date petition received: May 11, 2004

__ 90-day positive - FR date:

__ 12-month warranted but precluded - FR date:

__ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)? yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? yes

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations, and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (http://endangered.fws.gov/).

___ Listing priority change

Former LP: ___

New LP: ___

Date when the species first became a Candidate (as currently defined): October 25, 1999

___ Candidate removal: Former LP: ___

___ A - Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F - Range is no longer a U.S. territory.

___ I - Insufficient information exists on biological vulnerability and threats to support listing.

___ M - Taxon mistakenly included in past notice of review.

___ N - Taxon may not meet the Act's definition of "species."

___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Poaceae (Gramineae), Grass Family

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Florida, U.S.A.

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Florida, Miami-Dade County, U.S.A.

LAND OWNERSHIP: The current distribution of this species is entirely within Everglades National Park (ENP) and Big Cypress National Preserve (BCNP).

LEAD REGION CONTACT: Richard Gooch, 404-679-4124

LEAD FIELD OFFICE CONTACT: South Florida Ecological Services Office, David Martin, 772-562-3909 ext 230

BIOLOGICAL INFORMATION:

Species Description: *Digitaria pauciflora* is a herbaceous perennial grass 0.5-1 meter (1.5-3 feet) tall (Small 1933) that "is easily recognized in the field by its dense covering of erect hairs, giving the plant a very fuzzy and glaucous look" (Bradley and Gann 1999). The new treatment by Wipff (2004) for the new Flora of North America provides an illustration, plus a new description of the species.

Taxonomy: This species was first collected in 1903, and then was apparently not collected from 1936 until Charles E. Hilsenbeck rediscovered it in Everglades National Park (ENP) in 1973 (Bradley and Gann 1999). "The species was first described by Hitchcock in 1928 (see Webster and Hatch 1990) from specimens collected by Eaton from 'Jenkins to Everglade' in 1903 on a

collecting trip with J.K. Small and J.J. Carter. Hitchcock in Small (1933) later placed it in the genus *Syntherisma*. Subsequent authors (Webster & Hatch 1990, Hitchcock 1950, Wunderlin 1998) have retained it in the genus *Digitaria*." (Bradley and Gann 1999). Thus, the only synonym is *Syntherisma pauciflorum* (Hitchcock) Hitchcock ex Small.

Habitat: "Plants occur most commonly along the ecotone between pine rockland and marl prairie, but do overlap somewhat into both of these ecosystems. The soil where it occurred at the Richmond Pine Rocklands has been classified as Biscayne marl, drained (USDA 1996). These habitats, particularly marl prairie, do flood for one to several months every year in the wet season." (Bradley and Gann 1999). Pine rocklands and their associated prairies are fire-maintained, with a natural fire frequency of 3 to 7 years for pine rocklands and perhaps slightly more frequently for marl prairies (Bradley and Gann 1999). In the absence of fire, tropical hardwoods quickly encroach.

Historical Range/Distribution: Its historic distribution was from about south Miami to Long Pine Key, an "island" of pineland in ENP about 42 miles from south Miami. An early collection is by J. K. Small and J. J. Carter (No. 916, NY), "in pinelands near the homestead road, between Cutler and Longview Camp, Florida, Nov. 9-12, 1903" (cited in Bradley and Gann 1999). The 1903 Eaton collections from "Jenkins to Everglades" were possibly from the same collecting trip. Currently, it is only known from Long Pine Key. In 1995, a single plant was discovered in a small marl prairie on the grounds of the Luis Martinez U.S. Army Reserve Center in the Richmond Pine Rocklands in Miami-Dade County. This plant has since disappeared (The Nature Conservancy 1999; Herndon 1998; K. Bradley and G. Gann, The Institute for Regional Conservation, pers. comm. 1999).

Wipff (2004) noted that "*Digitaria pauciflora* is known only from the type collection, which was collected in pinelands of Dade County, Florida." He apparently did not have access to more recent collections, although the distribution map cites "reliable reports" from mainland Monroe and Collier Counties. The source of these reports is unknown. Wunderlin and Hansen (2004) report it only from Miami-Dade County.

Current Range/Distribution: *Digitaria pauciflora* is currently known from the Long Pine Key area of ENP (Bradley and Gann 1999), an area of about 8,000 hectares (31 square miles), "stretching from near the park entrance (just east of Long Pine Key), southwest to the Mahogany Hammock turnoff at the western end of Long Pine Key" (Bradley and Gann 1999, citing Avery 1983). The Institute for Regional Conservation (K. Bradley in litt. 2005) recently found populations in the BCNP south of Loop Road in Monroe County in the Gum Slough / Lostmans Pines area. They cite off-road vehicle usage as a threat to plants in this area.

Population Estimates/Status: Bradley and Gann (1999) estimate the Long Pine Key occurrence of this species to have approximately 1,001 to 10,000 individuals. The Institute for Regional Conservation (K. Bradley in litt. 2005) recently found populations constituting at least several thousand plants in the BCNP south of Loop Road. They have not been able to conduct a full survey in the area to determine its distribution and population size. "This plant has recently

disappeared from one locality [the Martinez Army Reserve site in Miami-Dade County] . . . the population in the Park seems to be stable." (Bradley and Gann 1999).

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range. Much of *Digitaria pauciflora*'s former potential habitat has been destroyed. Pine rocklands in Miami-Dade County (including patches of marl prairie) have been reduced to about 11 percent of their former extent (Kernan and Bradley 1996). Of the estimated historical extent of 74,000 hectares (182,780 acres), only 8,140 ha (20,106 acres) of pine rocklands remained in 1996. Another estimate was that outside of ENP (Long Pine Key, which is an "island" of pineland surrounded by marsh), only about 1 percent of the Miami Rock Ridge pinelands have escaped clearing, and much of the remaining pinelands are in small remnant blocks isolated from other natural areas (Herndon 1998). Pinelands and hammocks of Miami-Dade outside of ENP have been mapped and the Service is interpreting the results.

   Concern has been expressed that changes in water management in the Everglades system may alter the hydrology of the Long Pine Key portion of ENP, negatively affecting *Digitaria pauciflora* (Herndon 1998, Bradley and Gann 1999). Everglades restoration is being planned, and one objective is to provide more water to the Taylor Slough area and rehydrate the area around Long Pine Key. Because *Digitaria pauciflora* is a plant of transverse glades, restoration of historic water levels could be beneficial. With continued fire management and no major hydrological changes on Long Pine Key the population should remain stable (Bradley and Gann 1999).

B. Overutilization for commercial, recreational, scientific, or educational purposes. None known.

C. Disease or predation. None known.

D. The inadequacy of existing regulatory mechanisms. The Florida Department of Agriculture and Consumer Services designated *Digitaria pauciflora* as endangered under Chapter 5B-40, Florida Administrative Code. This listing provides little or no habitat protection beyond the State's Development of Regional Impact process, which serves to disclose impacts from projects, but provides no regulatory protection for State-listed plants on private lands. Without local or county ordinances preventing the destruction of the plant, conservation does not occur.

E. Other natural or manmade factors affecting its continued existence. Apart from the destruction of suitable habitat outside ENP, exotic plant invasions are the greatest threat to *Digitaria pauciflora*. So far, fire, which is required to maintain the pine rockland, is being applied successfully within ENP, and is keeping the exotic pest plant threat in check. Under natural conditions, lightning fires typically occurred at 3- to 7- year

intervals, or more frequently in marl prairies. With fire suppression, hardwoods eventually invade pine rocklands and shade out understory species like *Digitaria pauciflora*. Outside ENP, fire suppression has reduced the size of the areas that burn and habitat fragmentation has prevented fire from moving across the landscape in a natural way. Thus, much of the pine rockland vegetation is becoming tropical hardwood hammock. Exotic species can alter the type of fire that occurs in pine rocklands. Historically, pine rocklands had an open low understory where natural fires remained patchy, with relatively low temperatures, thus sparing many native grasses such as *Digitaria pauciflora*. Dense exotic plant growth can create much higher temperatures and longer burning periods. Pine rockland plants cannot tolerate these extreme conditions. As a result, the native plants sometimes may have to be conserved by removing exotics through methods other than burning. One such method, hand chopping followed by spot treatment, is labor intensive and very costly. So far, ENP has succeeded in keeping Long Pine Key's pineland vegetation intact.

Invasive exotic plants have significantly affected pine rocklands. At least 277 exotic plants are now known to have invaded pine rocklands throughout south Florida (U.S. Fish and Wildlife Service 1999). The most serious threats to pine rocklands have been Brazilian pepper (*Schinus terebinthifolius*) and Burmareed (*Neyraudia reynaudiana*). Brazilian pepper is a threat to marl prairies where *Digitaria pauciflora* occurs (Bradley and Gann 1999). So far, these two plants have been kept in check on Long Pine Key. The most troubling threat to *Digitaria pauciflora* on Long Pine Key and BCNP is Old World climbing fern (*Lygodium microphyllum*), which is spreading rapidly through southern Florida and has devastated tree islands in the Everglades as well as pinelands (Ferriter 2003, Volin et al. 2003). Old World climbing fern has the potential to become uncontrollable, except through biological control.

Recreational use of off-road vehicles has been suggested as a threat in BCNP.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

Everglades restoration is being planned with attention to water levels around Long Pine Key. ENP has invested in exotic pest plant management on and near Long Pine Key, including restoration of former agricultural lands. There are no conservation agreements for *Digitaria pauciflora*.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate)

The primary threats to this narrowly-distributed grass are, historically, the loss of much of its original habitat to urbanization and agriculture. For the near future, the primary concern is the likelihood that an extremely invasive exotic pest plant, the Old World climbing fern, may overwhelm its habitat within ENP and BCNP.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	**5***
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: Because this plant has a narrow distribution and habitat requirements (edges of marl prairie) and only occurs within the Long Pine Key area, any threat from exotic pest plants or other habitat management problems will be significant, therefore the magnitude of threats is high. The National Park Service has worked to control exotic pest plants and maintain an appropriate fire regime, but serious threats remain and cannot readily be removed.

Imminence: Threats to *Digitaria pauciflora* from invasive exotic pest plants have been successfully managed by the National Park Service. Impending threats from Old World climbing fern and perhaps other "new" exotic pest plants are expected to arrive within the next decade. As a result, it is appropriate to treat the preponderance of threats as "non-imminent."

Rationale for Change in Listing Priority Number (insert if appropriate): N/A

__Yes__ Have you promptly reviewed all of the information received regarding the species for

the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. This species benefits from land management by the National Park Service

DESCRIPTION OF MONITORING: Based upon recent information, this species is only known from the Long Pine Key area of ENP, an area of about 8,000 hectares (31 square miles) (Bradley and Gann 1999) and BCNP. The Long Pine Key occurrence has been estimated to have approximately 1,001 to 10,000 individuals, and appears stable (Bradley and Gann 1999). Due to their location within ENP and BCNP, we believe these occurrences remain stable, although monitoring for this species has not been conducted. Although the National Park Service is sponsoring a plant survey of ENP, results are not available. We expect that results of this survey will enhance our knowledge of the species' known distribution.

Changes in water management in the Everglades system may alter the hydrology of the Long Pine Key portion of the ENP and concern was expressed during early planning that this might negatively affect the Florida pineland crabgrass (Herndon 1998, Bradley and Gann 1999). However, current planning for Everglades restoration is to restore historic water regimes. Since the Service is involved in the restoration, effects to pineland crabgrass will be considered. Although still in the planning stages, biologists working on this restoration expect beneficial effects to the Long Pine Key ecosystem, including the pineland crabgrass.

Florida pineland crabgrass is relatively abundant within its very limited range on Long Pine Key. Once the National Park Service survey results are available, we will be able to better assess the status of this species. Monitoring may be advisable in the future as changes are made in water deliveries and / or if Old World climbing fern becomes a problem at Long Pine Key.

COORDINATION WITH STATES
Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: none

Indicate which State(s) did not provide any information or comments: Florida

LITERATURE CITED:

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Hitchcock, A. S. 1950. Manual of the grasses of the United States, second edition revised by Agnes Chase. U.S. Department of Agriculture Miscellaneous Publication No. 200. Washington, D.C. 1051 pages.

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Small, J. K. 1933. Manual of the southeastern flora. Univ. of North Carolina Press, Chapel Hill. 1554 pp. [Poaceae contributed by A.S. Hitchcock. *Syntherisma pauciflorum*, p. 51]

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Volin, J. C., M. S. Lott, J. D. Muss, D. Owen, and J. Stewart. 2003. The physiological ecology of the non-indigenous invasive *Lygodium microphyllum* in South Florida. Abstract, Seventh International Conference on the Ecology and Management of Alien Plant Species. Fort Lauderdale, Florida. http://199.245.200.45/pweb/document/?SOCIETY=esawssa&YEAR=2003&ID=29504

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Wipff. J. K. 2004. Digitaria, in Flora of North America, grass manual online. http://herbarium.usu.edu/grassmanual/. Accessed June 6, 2004.

Wunderlin, R. P. and B. F. Hansen. 2004. *Digitaria pauciflora* in Atlas of Florida vascular plants. http://www.plantatlas.usf.edu/main.asp?plantID=1108 Accessed June 6, 2004.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: /s/ Jeffrey M. Fleming 11/16/2005
Acting Regional Director, Fish and Wildlife Service Date

Concur: _____ August 23, 2006
Acting Director, Fish and Wildlife Service Date

Do Not Concur: _____ _____
Director, Fish and Wildlife Service Date

Date of annual review: October 2005

Conducted by: South Florida (Vero Beach) Field Office